MEA
Handbook for the Measure of ENVIRONMENT AWARENESS

Form A & B

(HIGH SCHOOL STUDENTS AND ADULTS OF HIGHER EDUCATION)

Prepared by :
Man Mohan Singh
L. S Prahlada Rao

E100
343

PROJECT : ENVIRONMENT AWARENESS
THROUGH COMMUNITY EDUCATION,
(SPONSORED & FUNDED BY DEPARTMENT OF SCIENCE & TECHNOLOGY GOVT. OF INDIA)

ENACE

VIKRAM A. SARABHAI COMMUNITY SCIENCE CENTRE,
NAVRANGPURA, AHMEDABAD-380 009.

343

COMMUNITY HEALTH CELL

MEA

Handbook for the Measure of ENVIRONMENT AWARENESS

Form A & B

(HIGH SCHOOL STUDENTS AND ADULTS OF HIGHER EDUCATION)

Prepared by :
Man Mohan Singh
L. S Prahlada Rao

COMMUNITY HEALTH CELL
326, V Main, I Block
Koramangala
Bangalore-560034
India

PROJECT : ENVIRONMENT AWARENESS
THROUGH COMMUNITY EDUCATION,
(SPONSORED & FUNDED BY DEPARTMENT OF SCIENCE & TECHNOLOGY GOVT. OF INDIA)

ENACE

VIKRAM A. SARABHAI COMMUNITY SCIENCE CENTRE,
NAVRANGPURA, AHMEDABAD-380 009.

343

E-100

COMMUNITY HEALTH CELL
47/1, (First Floor) St. Marks Road,
Bangalore - 560 001.

VIKRAM A. SARABHAI COMMUNITY SCIENCE CENTRE
NAVRANGPURA, AHMEDABAD.380009

With the rapidly mounting population of the earth combined with the use of modern technology to exploit the earth's resources for the comfort of the human being, very rapid changes are occurring in the earth's environment most of them pointing towards a rapid depletion of the earth's limited resources and a rapid deterioration of the environment affecting the quality of life. As the whole issue of environment centre's round human beings, it is only a proper understanding and approach by humans that can bring about the conditions requisite for a high quality of life.

As a part of the three-year research project on "Environment awareness through community education" sponsored and funded by the Department of Science & Technology (Government of India) New Delhi, we have compiled a questionnaire on the several factors of the environment to get a feel of the knowledge and attitudes of the community. This manual details the methodology used and the ways of administering the questionnaire. We felt the need for the Measure of Environment Awareness oriented to the conditions in our country as we are entering the era of technological development with quite a backlog of under-development and the problems that go with it.

We should be happy if the questionnaires with the help of this manual are responded to by a large cross section of the community.

MAN MOHAN SINGH
Scientist
Research & Evaluation Cell
VASCSC, Ahmedabad.

L.S.PRAHLADA RAO
Director, VASCSC
Investigator Incharge
DST Project

March 1981

A word of appreciation .....

Although the supplement is about use of the 'Measure of Environment Awareness' as perceived by the community at large, most of the statement about the situations are based on practical observations made in a number of pilot programmes conducted in the centre. I should, therefore, like to express my thanks and appreciation to those organisations and people who were involved in the programmes and to my own institute for giving me an opportunity to learn through the experience.

I am especially appreciative of the initial impetus given by Prof. L.S. Prahlada Rao, which enabled me to go through an important document written by Prof. Alan M. Voelker. He also enabled me to get the project started and continue to sustain it. His guidance critique and review have been a great help to me. I owe much to Prof. Alan M. Voelker and Prof. Richard H. Moyer for their valuable contribution. Miss Laxmi and Mr. Subbarao were a great help in the initial trial of the measure. Mr. Naresh C.Mehta carried out the later work of tabulating, analysing and documenting the data very deligently. I owe much to the team of 26 judges belonging to various disciplines, who spared their valuable time and very carefully and sincerely placed their judgement for each statement.

I feel sincerely thankful to those authors who influenced me through their writings and my conversations with them. Thanking all the people who helped me by my personal contacts or Prof. Rao's contacts is rather difficult. How does one acknowledge a crucial conversation or an off hand comment that later turns out to be a major lead? For helping me in designing, strategies and debates I must thank Prof. Y.P. Aggarwal, Prof.(Mrs.) S. Shukla, Dr.Jagdeesh Singh and teams of researchers at Kurukshetra University and M.S.University of Baroda.

I am thankful to Shri A.M.Bhatt and all VASCSC staff for sharing the responsibility in completing the task. Especially Prof. A.R. Rao, Dr. C.J. Sanchorawala, Dr. V.B. Kamble and Shri Ramesh Kothari extended their willing co-operation sparing their valuable time by reacting to each statement separately and individually. This was a great encouragement and enrichment of the attempt.I am sincerely thankful to Shri A. Krishnan for carefully handling the publication work.

MAN MOHAN SINGH

CONTENTS

TITLE	PAGE
1. Preamble	1
2. Test, devices and educational strategies	1
3. Definitions	4
4. Guidelines for the administration of the tests	7
5. General instructions	8
6. Instructions for scoring.	12
7. The MEA : Its orientation to reliability and validity.	14
8. Normative Data	18
9. Scope and limitations.	18
10. Bibliography.	

LIST OF FIGURES AND TABLES.

FIGURES:

Title.	Page
1. THEMATIC SCHEMOGRAPH OF ENVIRONMENT	5
2. PROPORTIONAL THEMATIC DISTRIBUTION OF ITEMS.	6
3. DISTRIBUTION INDICATING RELATIVE PERFORMANCE OF 73 UNTRAINED AND 26 EXPERTS.	16

TABLES:

1. LIST OF ITEMS AND SCALE VALUES IN EACH THEME.	13
2. SCORING PATTERN.	14

LIST OF ABBREVIATIONS USED

MEA	- Measure of Environment Awareness
EOS	- Environment Orientation Scale
EAS	- Environment Attitude Scale
ERS	- Environment Responsibility Scale
ER	- Ecological Relations
NNH	- Nature Nutrition and Health
POP	- Population
PL	- Pollution
FD	- Afforesting and deforesting
LU	- Land usage
C	- Correct
IN	- Incorrect
UN	- Uncertain
A	- Agree
SA	- Strongly Agree
D	- Disagree
SD	- Strongly disagree
't'	- "Critical Ratio"

COMMUNITY HEALTH CELL
326, V Main, I Block
Koramangala
Bangalore-560034
India

MEASURE OF ENVIRONMENT AWARENESS

PREAMBLE:

In recent years, considerable concern is expressed about environmental issues like the earth's depleting resources, deteriorating quality of life on planet earth, pollution, population explosion, poverty and the like. While some quarters project a doom's day picture of the earth, others reflect a visible callousness towards issues of environment. It is however, evident that a true concern for the environment cannot possibly emanate from discussions on an emotional plane. As this involves basically the question of attitudes, this can only be built up. This can be achieved only through sustained education and not by high pressure propaganda or indoctrination. With a basic understanding of the environmental factors, a certain degree of awareness would become possible which in turn would lead to right approaches to problems.

TEST /DEVICES & EDUCATIONAL STRATEGIES:

Development of educational strategies to impart knowledge about environment necessarily involves a fair degree of measurement of awareness in the community. It is here that the educator is faced with the problem of developing suitable test devices for measurement of awareness. For this, environment is basically to be viewed as a holistic proposition as there can be as many viewpoints on the environment is basically to be viewed as a holistic, as there are people and professions.

ment as there are people and professions What is involved is a basic comprehension of the environment in relation to human affairs rather than narrow, unidirectional view points of professionals. The degree of comprehension of environmental factors and issues determines equally the degree of responsibility and attitudes towards the environment. It is aptly remarked 'we know more about the backside of the moon than we do about the drop of water upon which each of us and all living organisms depend for survival.*. The continued existence of many species including possibly the very 'man' himself depends upon his ability to make conscious changes in his cultural attitudes, towards nature and his place in the biosphere (2). Unfortunately, the existing formal educational processes lay very little accent on environment. At best environment finds a little expression through the biology curricula but fails to be treated as an all-pervasive phenomena.

What the environment educator is looking for under these conditions are test devices which are fairly accurate, meaningful and with the minimal durations of testing and administration. He is also looking for a measure that clearly rates a set of given experiences whether it be positive attitudes and responsibility on the part of the pupils towards environmental issues or rate the high scores in environmental orientation. It could also be both. Negative attitudes, irresponsibility and low orientation to environmental issues are the other set of values to be rated. So far there does not seem to be available test

* Refer Bibliography

COMMUNITY HEALTH CELL
326, V Main, I Block
Koramangala
Bangalore-560034
India

devices suitable to the rich variety of conditions prevalent in our country's environment.

There now seems to be widespread interest in the measuring of awareness to environment related issues as could be seen from the considerable number of publications of Volkar & Harvat (1974) Moyer (1975) Kuhn (1980) Stronck (1975) Steiner and Barnhardt (1972) Wert (1975) Leek (1977) and Richmond (1976). These studies point to the fact that favourable attitudes while related to personal variables, the strongest predictor of environmental attitudes is to a large extent a previous knowledge of environmental facts (Fortner & Jeales). However, very few attempts have been made to combine the aspects of personal variables and factual environment knowledge to assess the individual/community awareness. In the present study the combined approach has been tried. The aspect of personal variables is considered as two variables viz. attitudes and responsibility. Equal emphasis is placed on the acquaintance of the participant with the factual knowledge of the environment. In a measure of environment awareness, the comprehensive nature of the awareness is what counts as this has a direct bearing on the relationships with human affairs. The role that a measure of environment awareness plays for need appraisal in school education and research need not be emphasised. The scales presently designed has been used in the environment education project, both formal and out of school

situations by the Vikram A.Sarabhai Community Science Centre.

DEFINITIONS:

A pair of tests has been developed. The criteria for these tests were (1) Fair precision (2) Maximum uniform thematic coverage to assess the differential impact of cultural, social and demographic variables (3) Adequate reliability, taking note of the time factor for administration and scoring. Environment for this purpose has been defined as a construct, constituent of, as many as eighteen themes, whereby all that surrounds mankind and which directly or indirectly influences the existance and continuity of living systems. Six major themes are identified:

- Ecological relationships
- Nature, nutrition and health
- Population
- Pollution
- Forestation and deforestation
- Land usage.

The Figure 1 gives a graphic representation of the themes taken note of in the conceptual aspect of the construct.

The themes namely Ecological Relations, Nature Nutrition and Health, Population, Pollution, Forestation and Deforestation and Land usage have been covered with a fairly uniform emphasis as could be

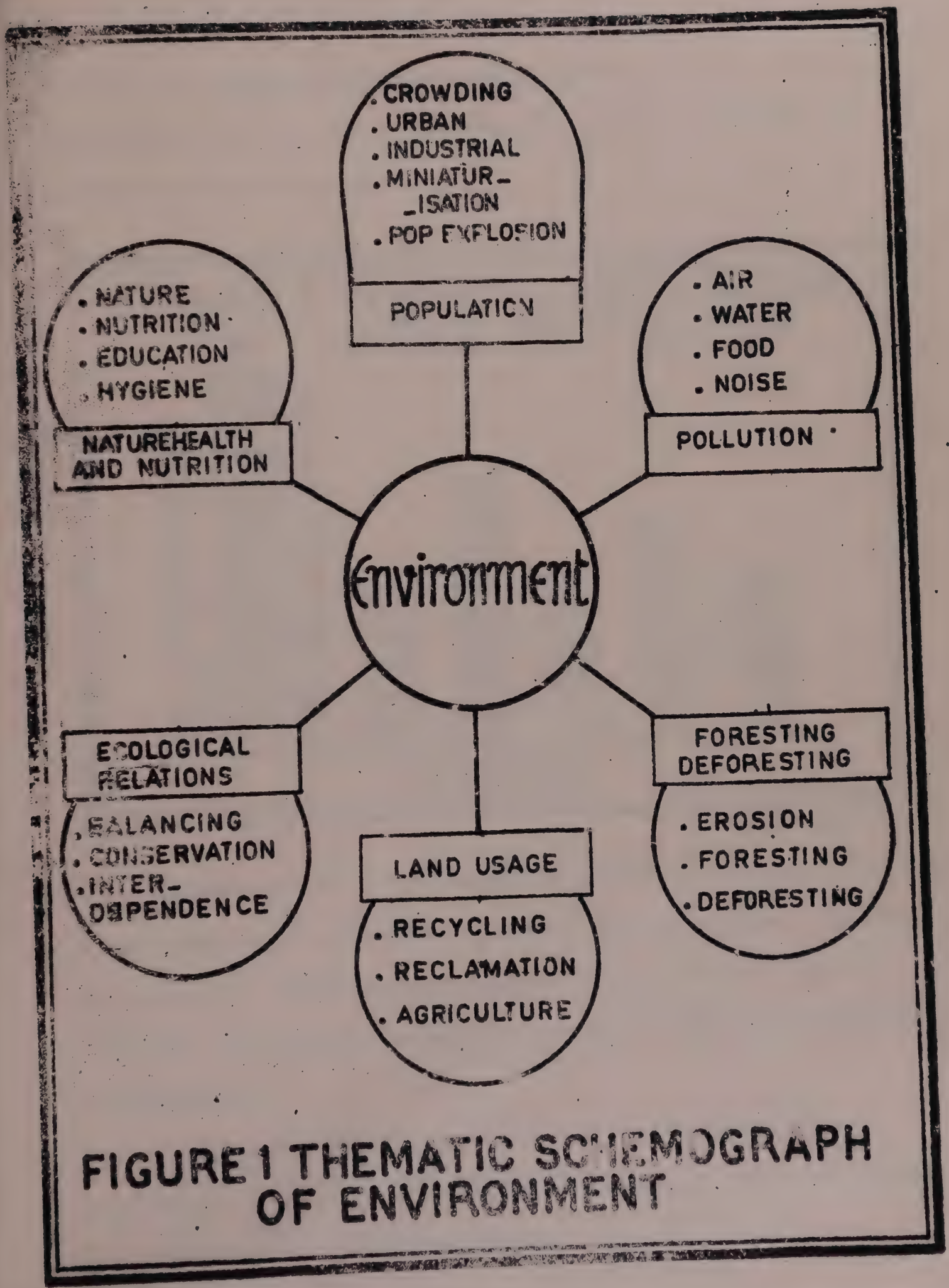
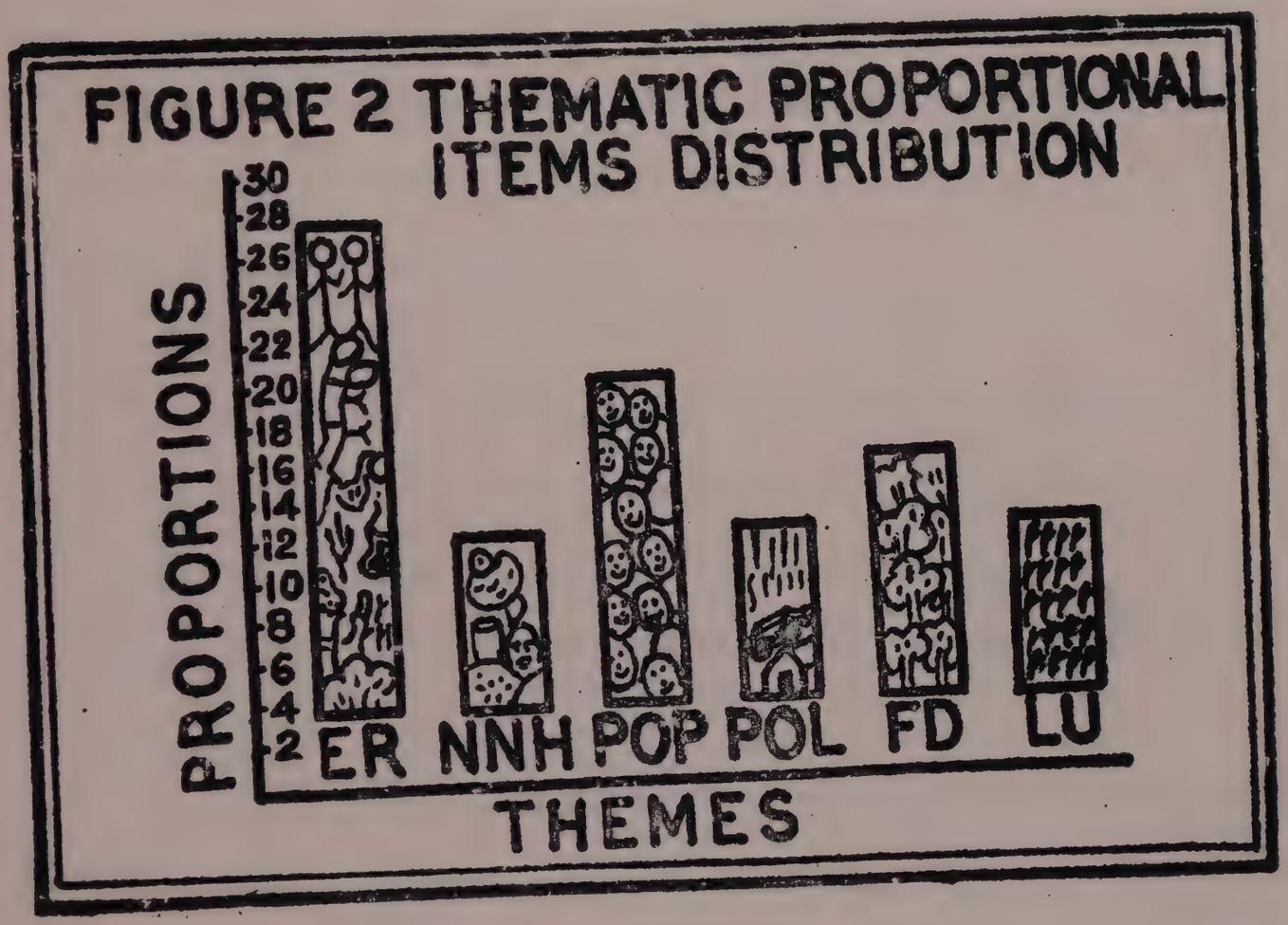


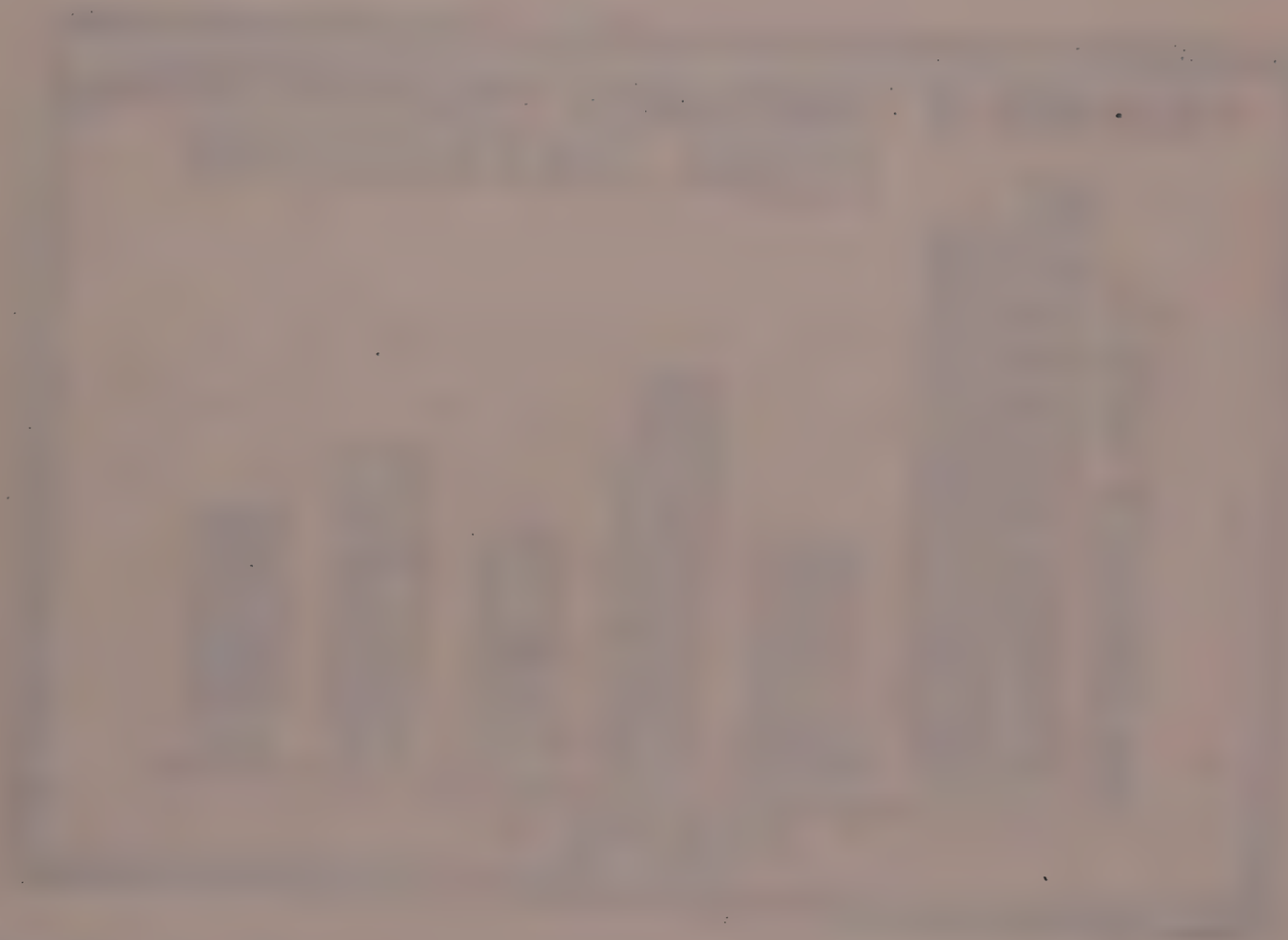
FIGURE 1 THEMATIC SCHEMOGRAPH OF ENVIRONMENT

seen from the following estimated percentages 28%, 12%, 20%, 12%, 16% and 12% respectively in that order. The Figure 2 graphically represents the percentage distribution of themes:



As stated earlier, "Environment Awareness" is taken as a composite of factual familiarity and personal variables. For the purpose of measuring awareness here, "Environment Orientation" is defined as the "degree of information or knowledge the individual can recall based on his resources and experience".

"Environment attitudes" are defined as "personal dispositions of individuals which influence their reactions to objects, situations or propositions in favourable or unfavourable ways".



COMMUNITY HEALTH CELL
326, V Main, I Block
Koramangala
Bangalore-560034
India

"Environment responsibility" is defined as the individual's expressed concern over the environmental issues and the degree of preparedness, for a responsible or irresponsible reaction.

In effect the measure takes into consideration how much knowledge the individual possesses, how they view man's relationship with the environment and thereby, the degree of preparedness for a positive reaction to environmental issues.

GUIDELINES FOR ADMINISTRATION OF THE TESTS:

What is developed here is a simple standardised questionnaire based on the theory of overt responses which clearly project the respondant's beliefs and concerns in his/her responses. This is a common but effective approach to study and measure the personal variables of the population.

The two forms A and B for the measure of environment awareness (MEA) are designed either for individual administration or group administration. The MEA has two parallel forms each having three sets of instructions and statements measuring familiarity, attitudes and responsibility. Each set of forms takes account of the six environmental themes. The measure is designed to provide three separate scores on environment orientation scale (EOS), environment attitude scale (EAS) and environment responsibility scale (ERS). Combined together these three give one integrated score on environment awareness.

For simple surveys Form A would serve the purpose. For a higher reliability, use of both the forms is recommended. It is ideal not to use the forms in quick succession. A pause in time, preferably of a few days of administering the two forms would avoid fatigue and thereby a higher reliability is expected. The test is so designed that answers can be marked by the participants on the form itself. The time involved is approximately forty minutes for a group of English medium students of IXth and Xth Standard. The tester should thoroughly familiarise himself with the instructions, contents and the probable time factor.

To begin with it is desirable to establish a rapport with the group by an informal discussion to enable a relaxed situation for administering the test. An informal atmosphere would go a long way in achieving positive results.

As reliability and validity of the MEA, to a large extent, depend upon a free and open reaction of the group, the participants, must be told to respond spontaneously and without undue pause. They should not rethink and restate their responses after finishing a section.

The particulars on the back of the test forms should be filled in by the participants first after which they turn to the front page to mark the responses.

GENERAL INSTRUCTIONS:

Introductory conversation for the purpose of testing should

proceed the administration. The group should be properly oriented as to how to go about marking their responses. It should be emphasised that there are really no clear cut right and wrong responses like right and wrong answers. Hence the nature of responses would in no way decide any grade or score as in an examination. The questionnaire consist of 22, 14 and 14 statements respectively for which responses are to be marked. In case of any doubts or confusion, this has to be cleared with the person administering the test rather than discussions amongst participants themselves. The instructions should be read very carefully.

PART I ORIENTATION:

Listed below are twentytwo fact statements. You will recognize that each one has a correct or incorrect response. Do not worry if you are unable to identify. In such cases, you can respond by checking the box under column UN (uncertain). But do read each statement carefully and respond by checking one of the three, C (Correct) IN (Incorrect) or UN (Uncertain) response boxes.

Check the box under Column C, if you consider the statement is correct.

Check the box under column IN, if you consider the statement is incorrect.

Check the box under column UN, if you are uncertain about the statement

Work fast, respond to each statement.

Wait till you are told to turn over.

After every one finishes, turn the page to part II ATTITUDE.

PART II ATTITUDE:

Listed below are fourteen statements depicting objects, situations or propositions to study favourable/unfavourable attitude you have towards your environment. You will recognise that they have the content of bipolarity and are of such nature that there are no correct or incorrect responses. Please respond as to the extent of your agreement/disagreement with each statement to reflect how you think about the same.

READ EACH STATEMENT CAREFULLY:

Check the box under column SA, if you strongly agree with the statement.

Check the box under column A, if you simply agree with the statement.

Check the box under column UN, if you are uncertain.

Check the box under column D, if you disagree with the statement.

Check the box under column SD, if you strongly disagree with the statement.

Remember, there are no correct or incorrect answers.

Work fast, respond to each statement.

After every one finishes, turn over to Part III RESPONSIBILITY.

PART III 'RESPONSIBILITY":

Listed below are fourteen statements depicting objects, situations or propositions to study favourable/unfavourable concern and preparedness you have towards your environment. Items are such that there are no rigid correct or incorrect responses. Please respond as to the extent of your agreement/disagreement with each statement. Reflect how you feel concerned and prepared about the same.

READ EACH STATEMENT CAREFULLY:

Check the box under column SA, if you strongly agree with statement.

Check the box under column A, if you simply agree to the statement.

Check the box under column UN, if you are uncertain.

Check the box under column D, if you disagree with the statement.

Check the box under column SD, if you strongly disagree with the statement.

Remember, there are no correct or incorrect answers.

Work fast, respond to each statement.

THANK YOU.

After the group completes the work, booklets should be promptly and quickly collected to prevent any losses or misplacement. Since individuals definitely differ in reading skills and comprehension, it is good to keep a flexibility. If some in the group finish the responses

343 COMMUNITY HEALTH CELL
47/1, (First Floor) St. Marks Road,
Bangalore - 560 001.

quicker than others, this is to be permitted.

INSTRUCTIONS FOR SCORING:

As the study incorporates the Eysenck and Crown (1949) technique, scoring would be by the combined weights of Likert and the scale values of Thurstone in the form of products. For convenience however, the simple procedure of assigning the Likert weight to the items may be used for scoring.

For the first part of both forms A and B, which include fact statements, score of 3 may be given to the correct response for the true statements (refer Table 1). Ascore of 2 for "uncertain" and a score of 1 for incorrect may be given, whereas for false statements the scoring pattern have to be reversed. 3 to "incorrect" 2 to "uncertain" and 1 to "correct"responses. (Refer Table 2)

For Part II and III, for positive statements a score of 5 for "strongly agree", 4 to "Agree", 3 to "Uncertain", 2 to "Disagree" and 1 to "Strongly disagree" are to be multiplied by the scale values given in brackets with item numbers. For negative items, the scores get reversed, 5 to "strongly disagree" to 1 for "strongly agree". Refer the table for correct method of scoring.

The scores of all statements in one particular theme added give the subtest score. A grand total of all the scores will give us the total scale of environment awareness. The table may be used to

COMMUNITY HEALTH CELL
326, V Main, I Block
Koramangala
Bangalore-560 034
India

arrive at the score. The total score of individuals, ignoring scale value of the items will vary between 50 to 206 on total scale of environment, whereas the scale can provide you six subscores varying between 14 -58, 6 to 26, 10 to 38, 6 to 26, 6 to 32 and 6 to 26 on ecological relations (ERS) Nature Nutrition and Health (NNHS) Population (PS), Pollution (PLS) foresting deforesting (FDS) and Land usage (LUS) scales respectively.

Similarly it can provide three subscores on Environment Orientation Scale, Environment Attitude Scale and Environment Responsibility scale with a score of variation of 22 - 66, 14 - 70, and 14 - 70 respectively.

TABLE 1 : List of items and scale values in each theme.

	Orientation		Attitude		Responsibility	
	True	False	Positive	Negative	Positive	Negative
ER	1,2,3	12,13,14	1 (7.81) 2 (8.2)	8(2.41) 9(2.20)	1(7.74) 2(7.58)	8(1.85) 9(2.56)
NNHE	15	4	10(8.60)	3(3.25)	10 (8.05)	3(1.85)
POP	5,6,7	16,17,18	11(6.91)	4(1.86)	11(7.85)	4(2.00)
POL	19	8	12(8.27)	5(1.58)	12(7.77)	5(1.95)
FD	9,10	20,21	6(8.36)	13(1.46)	6(7.28)	13(2.15)
LU	22	11	7(7.6)	14(2.42)	7(7.75)	14(2.82)

TABLE 2 : SCORING PATTERN

	Items	Response Format		
	Nature	C	UN	IN
ORIEN-TATION	True (+)	3	2	1
	False (-)	1	2	3

		SA	A	UN	D	SD
ATTITUDE & RESPON-SIBILITY	Positive	(5	4	3	2	1) *Scale value of the item.
	Negative	(1	2	3	4	5) *Scale value of the item.

THE MEA : ITS ORIENTATION TO RELIABILITY AND VALIDITY.

The total set of 143 debated statements were framed in the form of a questionnaire for pilot testing in November 1980. The sample consisted of 26 experts and 73 untrained students from Std. IX and above level participating in the programmes at the Vikram A. Sarabhai Community Science Centre, Ahmedabad.

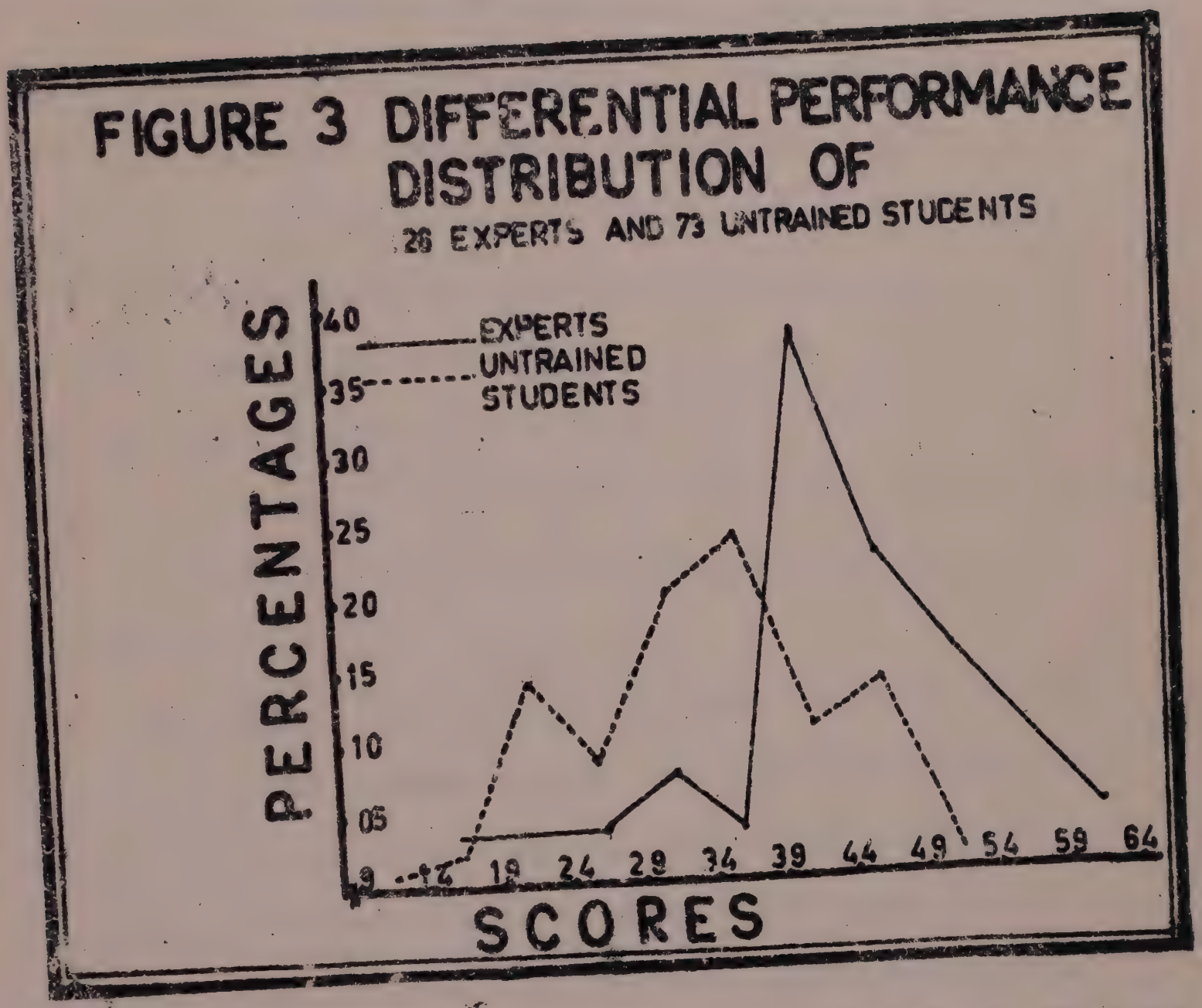
The coefficient of stability was determined by test and retest reliability. For this purpose a group of students from secondary school level was retested after a fortnight. The Pearsons product moment correlation was calculated which came out to be .88 supporting the consistency of the measure fairly well. The coefficient of rational equivalance is not yet worked out because two equivalent final forms

were not ready. The statistics can now be found out to know how it supports the test.

The reliability of the MEA was established calculating a coefficient of internal consistency. Although the MEA was a measure of a construct and split half reliability was not advisable, the systematic item arrangement of the questionnaire made it possible to divide the MEA using odd-even strategy into two equivalent parts. The split-half reliability so computed came out to be .68 which again after applying the Spearman Brown Formula for length correction, got increased to .81 establishing fairly good consistency of the measure.

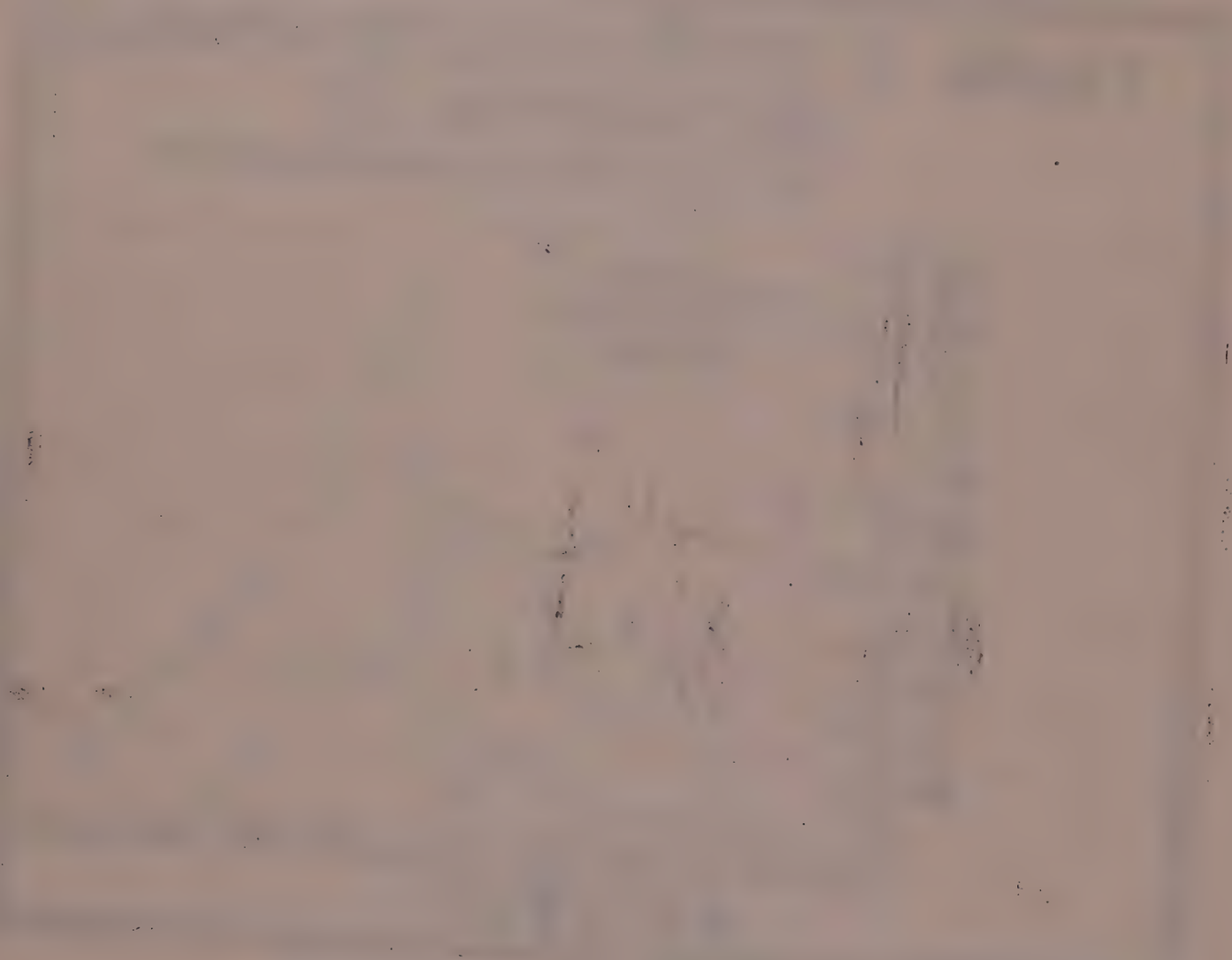
It was decided to check the validity of the scale by using a criterion group (Experts) assumed to attain higher Score on MEA than the typical 9th and 10th standard untrained students. The questionnaire was sent for response to a group of Researchers, Educators, Teachers and related personnel who indicated their willingness to assist in the development and administration of the tool. It was assumed that these persons would have favourable attitude, concern and understanding of the issue and so would score better on the scale.

Analysis of differences in the two distributions (see Fig.3) was followed by 't' testing with unequal 'N'. The critical value so computed was 't' - 2.99 indicating significant differences in assumed direction beyond the level of .01 significance between the performance of senior experts and untrained students on Environment Awareness



Degree of maximum association for each item was calculated. The items attaining the degree of association more than .60 and were not sorted in more than two categories were only retained.

The content validity of the statements on the MEA was determined by the latent partition method. After a final elimination of ambiguous and vague items which still remained were properly arranged and were given to a panel of five environmental/science educators for category sorting. All such statements so selected for MLA are deemed to have content vali-



dity as was expressed by the reaction analysis of the experts.

Construct validity of the measure can be argued on the basis of their selection depending upon item total correlations. The item total correlations were calculated for all the 143 pre-tried out statements. The correlation varied from 0.02 to 0.8. In two of the cases the correlations exceeded beyond one may be because the distribution for that statement could be bimodal. All statements having correlation less than .205 were rejected (Refer Table D of Fundamentals of Statistics in psychology and education by J.P.Guilford). Such selected items established the consistency and validity of almost all criteria for evaluation.

The validity of the scale indicates whether it actually measures what it is supposed to measure and the many aspects of the problem of which that described above is just one, are dealt with in detail by Oppenheim. It is difficult to ensure whether a respondent gives a really true answer on a questionnaire even by repeating the question in several different forms. In a few places you may find some indirect repetition but this was not necessary as the purpose of the questionnaire is supposed to have been explained fully to the participants. It was also made clear that the questionnaire will not be used for personal assessment so that the answers would be free from ambiguity. Before the revised edition is brought out, it is also proposed to cross validate the questionnaire with that of Moyer's Unobtrusive inventory.

NORMATIVE DATA

The possible range of scores on the measure of environment awareness using Likert's format is from 50 to 206. The mean scores, Standard Deviation and existing norms are yet to be found out by administering the questionnaire on a very large sample of population which would be added to the present supplement later on.

SCOPE AND LIMITATIONS:

Since the measure of environment awareness is designed to evaluate the awareness of the group of students as well as other members of the community who come and avail the facilities of the centre, it was difficult to design and prepare a measure for a wide range of clientele consisting of schoolgoers and non-school goers. What was thought practical at the outset was to confine the initial attempt to most relevant group in terms of their active participation with a motivation for learning. It was therefore decided to define the population viz. the students from Std.IX and Std.X as the base line for the purpose of administration.

Since this is not a measure of abilities, it does not restrict the applicability to only Std.IX and Std.X pupils. But it can be used with a larger and varied population who could read, write and understand the language. This can also be used with groups of different backgrounds in terms of environmental differentiations so as to obtain different appraisals to suit the need.

COMMUNITY HEALTH CELL
326, V Main, I Block
Koramangala
Bangalore-560034
India

The Environment Awareness Scale has a greater advantage for educators, project leaders, curriculum evaluators and researchers for impact analysis of their programmes. The MEA can be used for measuring an individual student or a group of students for providing information about the changes in participants over a period of time. This can be used as a part of the inbuilt evaluation of any of the project concerning Environment Awareness so as to conduct pre-post facto comparable studies and explore the findings and their directions in terms of objective attainments.

Further more, the major advantage of the MEA has over some rarely available tests is that it yields a separate score for each theme instead of only a single over all score. Thus it makes possible to obtain a profile of thematic awareness of different sectors of community, thereby provide possible indications of needed emphasis various themes demand. This helps to structure the content of environment programme depending upon the needs of the different sectors.

Finally, the most important advantage of the MEA is its economy. Since it is suitable for group administration, around 50 students (one class as usual) can be given the test within 45 minutes as per the usual duration of the period.

COMMUNITY HEALTH CELL
326, V Main, I Block
Koramangala
Bangalore-560034
India

BIBLIOGRAPHY

CRONBACH.I.J. (1971) "Test Validation" in R.I. Thorndike (Ed.) Educational Measurements. Second edititon Washington, American Council on Education.

EDWARDS A (1967) "Techniques of attitude scale construction. New York Appleton Century-Crofts

EYSENCK H.J., and CROWN S (1949) "An experimental study in opinion-attitude methodology. Int.J.Opin.Att.Res. 3 - 47 - 86

GUILFORD J.P. (1973) "Fundamental statistics in psychology and education" -McGraw Hill Kogakusa Ltd.

GUILFORD J.P (1954) "Psychometric methods" McGraw Hill, Kogakusa Ltd.

HARVEY, GARY D: (1977) "A conceptualization of environmental education". In Aldrich, Blackburn and Abel, Eds., A Report on the North American Regional Seminar on Environmental Education, Columbus, ERIC, Ohio State University

KUHN D.T. (1980) "The development and application of energy opinion-naire; Journal of environment education V.11 N.4 pp 25 - 28

MOYER R.H. (1976) 'Moyer unobtrusive survey of environmental attitudes -second edition. University of Michigan Dearborn

NUNNALLY J.C. (1967) Psychometric Theory, New York, McGraw Hill

OPPENHEIM A.N. (1966) "Questionnaire Design and attitude measure-ment (Heinemann 1966) p.121

SIEGAL S (1956) "Non-parametric statistics for the behavioural sciences (McGraw Hill) ch.3

STAMM, KEITH R., & JOHN E.BOWES - "Environmental attitudes and reaction" Journal of Environmental Education 3(3):56-60

STAPP, WILLIAM B.,et.,al. "The concept of environmental educa-tion" - Journal of environmental education I No.1 30-31

STEINER R & BARNHARDT R. "The development of an instrument to assess environmental attitudes utilizing factor analytic techniques. "Science Education 56 472 -432 No.4

BIBLIOGRAPHY (contd)

STRONCK D (1972) "A questionnaire on environmental issues". The American Biology Teacher 34 No.4 ; 212 - 214

SWAN, JAMES (1967) "An analysis of attitudes and coping strategies of High School Youth, Response to Air Pollution" 'Unpublished Ph.D. thesis, University of Michigan.

TOWLER, JOHN & JAMES E.SWAN - "What do people really know about pollution," Journal of Environmental Education 4(I): 54 - 57

VOELKER, ALAN M., FRED HEAL & ROBERT E.HORVAT: "The development of an instrument for determining the nature of elementary school children's environmental decisions, Final Report, Project 2-E-026 U.S. Office of Education, DHEW, Washinton.

VOELKER, ALAN M., FRED HEAL, & ROBERT E.HORVAT:(1976) "Environmental orientations; A Holistic approach to environmental education education research".

VOELKER, ALAN M., FRED HEAL * ROBERT E.HORVAT (1973) "An annotated bibliography of environmental education-related research 1969-1972. Centre for environmental communications and education studies (CECES) Report, University of Wisconain, 410 N.Murray, Madison 53706 (available on request to CECES).

* SLONIM GILVIN M (1977) "Ocsania Education : Pathway to the frontier of the future" Environment Education Report 5 November 1977; 566

* refer Page 2.

COMMUNITY HEALTH CELL
326, V Main, I Block
Koramangala
Bangalore-560034
India